

WHAT IS CLAIMED IS:

1. An internal unit incorporated in a body of a submarine apparatus, the unit comprising:

including at least one electronic-circuit printed board having a part to be adjusted; and

wherein said coupling-bar fixing surfaces are located at positions shifted from said electronic-circuit printed board.

a plurality of system units placed in a predetermined arrangement, the system units including an optical-fiber containing portion containing an optical fiber, an electric-supply-line containing portion containing an electric-supply line, and at least one electronic-circuit printed board having a part to be adjusted; and

wherein said coupling-bar fixing surfaces are located at positions shifted from said optical-

fiber containing portion, said electric-supply-line containing portion, and said electronic-circuit printed board.

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3. The internal unit as claimed in claim 1, wherein each of said system units has inclined  
10 surfaces on both sides thereof; and  
said inclined surfaces form said coupling-bar fixing surfaces.

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4. The internal unit as claimed in claim 2, wherein each of said system units has inclined surfaces on both sides thereof; and  
20 said inclined surfaces form said coupling-bar fixing surfaces.

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5. The internal unit as claimed in claim 1, further comprising a plurality of covers fixed to said coupling bars by screws so that each of said covers lies across the coupling bars adjacent in a  
30 circumferential direction,  
wherein the covers adjacent in the circumferential direction are placed so as to form a gap therebetween, the gap being located at a position opposing each of said screws fixing said  
35 coupling bars.

6. The internal unit as claimed in claim 2, further comprising a plurality of covers fixed to said coupling bars by screws so that each of said covers lies across the coupling bars adjacent in a circumferential direction,

wherein the covers adjacent in the circumferential direction are placed so as to form a gap therebetween, the gap being located at a position opposing each of said screws fixing said coupling bars.

7. The internal unit as claimed in claim 1, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

8. The internal unit as claimed in claim 2, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

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11. The internal unit as claimed in claim  
5, wherein each of said system units comprises an  
optical circuit unit including an optical circuit  
component module, a power-supply circuit unit  
5 including a power-supply module, and a control  
circuit unit, the optical circuit unit, the power-  
supply circuit unit and the control circuit unit  
being stacked on each other, and

10 said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof.

15 12. The internal unit as claimed in claim  
6, wherein each of said system units comprises an  
optical circuit unit including an optical circuit  
component module, a power-supply circuit unit  
20 including a power-supply module, and a control  
circuit unit, the optical circuit unit, the power-  
supply circuit unit and the control circuit unit  
being stacked on each other, and

25 said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof.

30 13. The internal unit as claimed in claim  
1, wherein each of said system units comprises an  
optical circuit unit including an optical circuit  
component module, a power-supply circuit unit  
35 including a power-supply module, and a control  
circuit unit, the optical circuit unit, the power-  
supply circuit unit and the control circuit unit

being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

5       said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

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14. The internal unit as claimed in claim  
15 2, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-  
20 supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

25       said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

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15. The internal unit as claimed in claim  
35 3, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit

5           said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof, and

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25           said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof, and

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17. The internal unit as claimed in claim

5, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

18. The internal unit as claimed in claim 6, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.



19. A submarine apparatus comprising:  
a cylindrical airtight body; and  
an internal unit incorporated in said body,  
the internal unit including:

- 5 a plurality of system units placed in a  
predetermined arrangement, the system units  
including at least one electronic-circuit printed  
board having a part to be adjusted; and  
coupling bars fixed to coupling-bar fixing  
10 surfaces of said system units by screws so as to  
couple said system units in said predetermined  
arrangement,  
wherein said coupling-bar fixing surfaces  
are located at positions shifted from said  
15 electronic-circuit printed board.

- 20 20. A submarine apparatus comprising:  
a cylindrical airtight body; and  
an internal unit incorporated in said body,  
the internal unit including:

- 25 a plurality of system units placed in a  
predetermined arrangement, the system units  
including an optical-fiber containing portion  
containing an optical fiber, an electric-supply-line  
containing portion containing an electric-supply  
line, and at least one electronic-circuit printed  
30 board having a part to be adjusted; and  
coupling bars fixed to coupling-bar fixing  
surfaces of said system units by screws so as to  
couple said system units in said predetermined  
arrangement,  
35 wherein said coupling-bar fixing surfaces  
are located at positions shifted from said optical-  
fiber containing portion, said electric-supply-line

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containing portion, and said electronic-circuit printed board.

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21. The submarine apparatus as claimed in claim 19, wherein each of said system units has inclined surfaces on both sides thereof; and

10 said inclined surfaces form said coupling-bar fixing surfaces.

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22. The submarine apparatus as claimed in claim 20, wherein each of said system units has inclined surfaces on both sides thereof; and

20 said inclined surfaces form said coupling-bar fixing surfaces.

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23. The submarine apparatus as claimed in claim 19, further comprising a plurality of covers fixed to said coupling bars by screws so that each of said covers lies across the coupling bars adjacent in a circumferential direction,

30 wherein the covers adjacent in the circumferential direction are placed so as to form a gap therebetween, the gap being located at a position opposing each of said screws fixing said coupling bars.

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24. The submarine apparatus as claimed in claim 20, further comprising a plurality of covers fixed to said coupling bars by screws so that each of said covers lies across the coupling bars

5 adjacent in a circumferential direction,

wherein the covers adjacent in the circumferential direction are placed so as to form a gap therebetween, the gap being located at a position opposing each of said screws fixing said

10 coupling bars.

25. The submarine apparatus as claimed in claim 19, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

26. The submarine apparatus as claimed in claim 20, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

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27. The submarine apparatus as claimed in claim 21, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

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28. The submarine apparatus as claimed in claim 22, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

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29. The submarine apparatus as claimed in claim 23, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

10       said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

15       30. The submarine apparatus as claimed in claim 24, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other, and

20       said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof.

30       31. The submarine apparatus as claimed in claim 19, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit

unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

5       said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

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32. The submarine apparatus as claimed in  
15 claim 20, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the  
20 power-supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

25       said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

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33. The submarine apparatus as claimed in  
35 claim 21, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply

5           said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof, and

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25           said control circuit unit includes a  
printed board used for adjusting and address-setting  
mounted on an outer surface thereof, and

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35. The submarine apparatus as claimed in

claim 23, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.

36. The submarine apparatus as claimed in claim 24, wherein each of said system units comprises an optical circuit unit including an optical circuit component module, a power-supply circuit unit including a power-supply module, and a control circuit unit, the optical circuit unit, the power-supply circuit unit and the control circuit unit being stacked on each other,

said control circuit unit includes a printed board used for adjusting and address-setting mounted on an outer surface thereof, and

said control circuit unit has a trapezoidal shape when viewed in a longitudinal direction so as to form said coupling-bar fixing surfaces on both sides thereof, the coupling-bar fixing surfaces being inclined in a form of a roof.